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|---------------------------------------------------|------------|---------------|-----------------------------------------------------|
| Semester: | Third | Branch: | CE/IT/CSE/Civil/Metallurgy/EC |
| END SEMESTER EXAMINATION – November-December 2022 | | | |
| Subject Code: | MA0314 | Subject Name: | Probability, Statistics & Numerical Analysis (PSNA) |
| Date: | 06-12-2022 | Time: | 3 Hrs. 2:00 to 5:00 |
| Day: | Tuesday | Total Marks: | 100 |

Instructions:

1. Attempt all questions
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicates full marks
4. Questions shall be drawn in accordance with the unit numbers as given below,

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|----------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----|----|----|----|----|----|----|---------------|----|----|----|----|----|---|---|--|
| Q.1 | A | 1) Three unbiased coins are tossed. Find the probability of getting (i) exactly two heads, (ii) at least one tail, (iii) at most two heads, (iv) a head on the second coin, and (v) exactly two heads in succession. | 05 | | | | | | | | | | | | | | | | |
| | | 2) A box contains 4 white, 6 red, 5 black balls, and 5 balls of other colors. Two balls are drawn from the box at random. Find the probability that both are white or both are red. | 05 | | | | | | | | | | | | | | | | |
| | B | 1) Two unbiased dice are thrown at random. Find the probability distribution of the sum of the numbers on them. | 05 | | | | | | | | | | | | | | | | |
| | | 2) An unbiased coin was tossed 6 times. Applying Binomial distribution, find the probability of getting (i) exactly 4 tails; (ii) at least 4 tails. | 05 | | | | | | | | | | | | | | | | |
| Q.2 | A | Calculate the arithmetic mean and standard deviation for following data using assumed mean formula. Here take assumed mean $a=13$ | 10 | | | | | | | | | | | | | | | | |
| | | <table><tr><td>Size of the item (x)</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td></tr><tr><td>Frequency (f)</td><td>2</td><td>7</td><td>11</td><td>15</td><td>10</td><td>4</td><td>1</td></tr></table> | Size of the item (x) | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Frequency (f) | 2 | 7 | 11 | 15 | 10 | 4 | 1 | |
| Size of the item (x) | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | | | | | | | | | | |
| Frequency (f) | 2 | 7 | 11 | 15 | 10 | 4 | 1 | | | | | | | | | | | | |
| | B | Calculate the correlation coefficient between x and y using the following data. Also calculate coefficient of variation (CV). | 10 | | | | | | | | | | | | | | | | |
| | | <table><tr><td>x</td><td>2</td><td>4</td><td>5</td><td>6</td><td>8</td><td>11</td></tr><tr><td>y</td><td>18</td><td>12</td><td>10</td><td>8</td><td>7</td><td>5</td></tr></table> | x | 2 | 4 | 5 | 6 | 8 | 11 | y | 18 | 12 | 10 | 8 | 7 | 5 | | | |
| x | 2 | 4 | 5 | 6 | 8 | 11 | | | | | | | | | | | | | |
| y | 18 | 12 | 10 | 8 | 7 | 5 | | | | | | | | | | | | | |
| Q.3 | A | Evaluate $\int_0^6 \frac{dx}{1+x^2}$ taking $h=1$ by applying Simpson's 1/3 rule and Trapezoidal rule. | 10 | | | | | | | | | | | | | | | | |

